

**IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF MASSACHUSETTS**

iROBOT CORPORATION,

Plaintiff,

v.

SHARKNINJA OPERATING LLC,
SHARKNINJA MANAGEMENT LLC,
AND SHARKNINJA SALES COMPANY,

Defendants.

C.A. No. 1:19-cv-12125-ADB

SHARKNINJA'S OPENING CLAIM CONSTRUCTION BRIEF

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Ex. D	U.S. Patent No. 8,418,303
Ex. E	Amendment filed December 12, 2012 in U.S. Application No. 13/307,893
Ex. F	U.S. Patent No. 9,492,048
Ex. G	Original claims in U.S. Application No. 12/867,464
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Ex. K	“Disengage,” Webster’s New World Dictionary, published 1977
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Ex. M	A.C. Hoffman & L.E. Stein, Gas Cyclones and Swirl Tubes: Principles, Design and Operation 8-11, (Springer-Verlag Berlin Heidelberg 2002)
Ex. N	“Cyclone,” McGraw-Hill Dictionary of Engineering 142 (2nd ed. 2003)
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Ex. S	U.S. Patent No. 10,045,676

I. INTRODUCTION

SharkNinja’s approach to claim construction is consistent and targeted. SharkNinja surgically selected those few terms from the five asserted patents that need construction.¹ The terms SharkNinja seeks to construe are either over-technical language that requires explanation for lay jurors, or terms that have clear meanings from the intrinsic record that iRobot is attempting to avoid. In both cases, SharkNinja’s constructions are intended to give the terms the undeniable meaning that they would have to a skilled artisan based on the intrinsic record.²

iRobot’s approach is that of a typical patent plaintiff. Its view is that—across five unrelated patents—only two terms require construction. As with most patent plaintiffs, the reason is simple: iRobot seeks to twist the claims to cover subject matter clearly different from what the inventors actually invented. And as every patentee knows, the best way to do that is to simply avoid construing the claims at all. A simple example is the term “removable,” used in the ’038 and ’303 patents. iRobot argues that term covers components that can be removed by *any* means, even by exerting so much force that they break in the process. But the term “removable” has the same meaning in the patents as in real life: something is removable if it is designed to be taken off and put back on. The same theme repeats itself for the other terms. For those, iRobot seeks a non-construction or an “ordinary meaning” construction, but its alternative constructions belie its true motive of eviscerating inconvenient claim limitations.

II. LEGAL STANDARDS

Claim construction is a question of law. *Teva Pharma. USA, Inc. v. Sandoz, Inc.*, 135 S.

¹ The asserted patents are: 9,550,294 (“the ’294 patent”), 8,950,038 (“the ’038 patent”), 9,492,048 (“the ’048 patent”), 8,418,303 (“the ’303 patent”), and 10,045,676 (“the ’676 patent”).

² The parties’ constructions are attached in Exhibit A.

Ct. 831, 837 (2015). Courts must construe each disputed claim term based on its ordinary and customary meaning to a person of ordinary skill in the art in light of the intrinsic evidence—the claims, the specification, and the prosecution history. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–13 (Fed. Cir. 2005) (en banc). Claim construction “typically begins and ends with the intrinsic evidence.” *Ericsson, Inc. v. D-Link Sys., Inc.*, 773 F.3d 1201, 1218 (Fed. Cir. 2014).

The language in the claims themselves provides substantial guidance as to the meaning of the terms, but the claims must be read in light of the specification. *See Phillips*, 415 F.3d at 1315 (“[T]he specification ‘is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.’” (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996))). The specification must be considered because it is part of the “fully integrated written instrument” that defines the scope of the claims. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 978 (Fed. Cir. 1995), *aff’d*, 517 U.S. 370 (1996). The prosecution history may also provide guidance as to how the PTO and inventor understood the scope of the patent. *See Phillips*, 415 F.3d at 1317. The prosecution history of a parent application may also be relevant to claim terms in later applications. *Augustine Medical, Inc. v. Gaymar Industries, Inc.*, 181 F.3d 1291, 1300 (Fed. Cir. 1999).

Courts may consider extrinsic evidence, such as dictionaries, to determine the meaning of terms. *Id.* Such evidence, however, must not “contradict any definition found in or ascertained by a reading of the patent documents.” *Id.* at 1324 (citing *Vitronics*, 90 F.3d at 1584 n.6).

III. DISPUTED TERMS FROM THE ’294 PATENT

A shorthand for the ’294 patent is “recharge and resume,” but the patent claims a cleaning robot with a navigational control unit that is configured to autonomously perform a specific sequence of operations to: (1) control a motor to direct the robot around the room; (2) return the robot to a base charging station before completing a cleaning task in the room in response to

detecting a need to recharge the battery; (3) dock the robot upon return; (4) recharge with the robot docked; and then to (5) direct the robot to continue to clean the room. Ex. B at claim 1. As to the second claimed function, the state of the battery is detected and, based on that state, the robot is returned to the base charging station to recharge the battery.

A. “coulometry” (’294 patent, claim 10)

SharkNinja’s construction of “coulometry” is the patent specification’s definition:

Various methods are available to monitor the energy level 214 of the power source, such as **coulometry (i.e., the measuring of current constantly entering and leaving the power source)**, or simply measuring voltage remaining in the power source. [Ex. B at 15:50-54 (emphasis added).]

The Federal Circuit has held that the use of “i.e.” “signals an intent to define the word to which it refers.” *TF3 Ltd. v. TRE Milano LLC*, 894 F.3d 1366, 1372 (Fed. Cir. 2018), quoting *Edwards Lifesciences LLC v. Cook Inc.*, 582 F.3d 1322, 1334 (Fed. Cir. 2009); see *SkinMedica, Inc. v. Histogen Inc.*, 727 F.3d 1187, 1202 (Fed. Cir. 2013) (“i.e.” is definitional when it “comports with the inventors’ other uses . . . in the specification and with each and every other reference”). The single use of the word “coulometry” in the specification is with the defining signal “i.e.” supporting SharkNinja’s construction.

In addition to conflicting with the specification’s definition, iRobot’s construction introduces an unclear timing component, “over time.” Because this added phrase injects confusion over how much time is required for the “flow of electric charge,” it should be rejected.

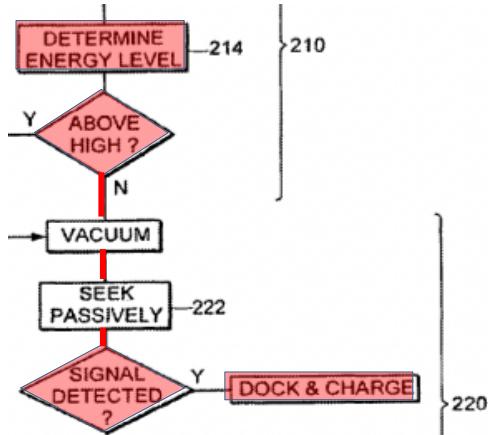
B. “detecting a need to recharge the energy storage unit” (’294 patent, claim 1)³

SharkNinja’s construction is consistent with the Court’s PI Order, stating that “claim 1’s use of the word ‘detecting’ requires the [robotic vacuum cleaner] to take an action in order to

³ This term was briefed and argued as part of iRobot’s Preliminary Injunction (“PI”) motion. See Dkt. 77 at 11-15. SharkNinja incorporates that briefing and argument here. See Dkts. 50 and 75.

determine whether there is a need to recharge.” Dkt. 77 at 14. The Court correctly characterized that action – or measurement – as detecting “remaining battery life.” *Id.* at 13, 15.

This is consistent with the specification, which explains that the need to recharge is determined based on detected remaining battery life. Figure 7 depicts a sequence in which the



robot “continually monitors its energy level 214.” Ex. B at 5:16-18, 15:37-42 and 49-50. The control sequence includes several energy “subsequences” “based on the measured energy level of the robotic device.” *Id.* at 15:39-41. The energy level of the battery is monitored by measuring the current or voltage of the battery or using a

timer and a look-up table. *Id.* at 15:50-63. The robot compares the detected energy level to a threshold to determine whether to remain in a high energy level subsequence 210 or enter a lower energy level subsequence, in which the robot docks and recharges. *Id.* at 15:37-66.

In the ’294 patent claims, the decision to return the robot to the dock to recharge is based on the state of the battery. As the Court recognized, iRobot’s own expert testified that “there needs to be some measurement of physical quantities that provide information to the controller that allows the robot to know that it is low on energy...” Dkt. 77 at 14-15. Based on detected remaining battery life, the robot determines whether it needs to recharge.⁴ Based on the claim language and consistent with the specification, the term “detecting a need to recharge the energy storage unit” means “determining a need to recharge based on detecting remaining battery life.”

iRobot’s alternative construction should be rejected because it broadens the claims beyond

⁴ A stated *alternative* to detecting a need to recharge the battery is using a predetermined time period. Ex. B at 15:50-63.

the claim language and the patent's disclosure by removing the claim requirement of "detecting a need to recharge the energy storage unit." iRobot's proposal of replacing "detecting" with "determining" eliminates the Court's previous observation that "the word 'detecting' requires the RVC to take an action in order to determine whether there is a 'need to recharge.'" Dkt. 77 at 14.

SharkNinja's construction aligns with the claim language, the specification, and the Court's previous analysis. "The construction that stays true to the claim language and most naturally aligns with the patent's description of the invention will be, in the end, the correct construction." *Phillips*, 415 F.3d at 1316 (quotation omitted).

C. "navigational control system configured to autonomously: control ... return ... dock ... recharge ... and then to continue" ('294 patent, claim 1)

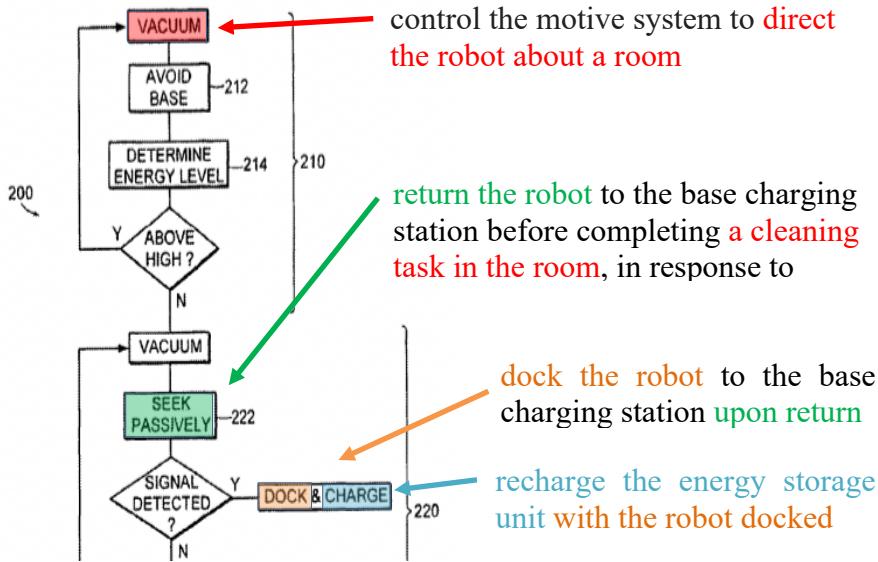
The parties agree that "autonomously" means "without human assistance or intervention," consistent with the specification. Ex. B at 1:40-41. iRobot contends that, if any construction is necessary, that is all. Construing just "autonomously," however, omits context as to the sequence of claimed functions the robot is configured to perform. "[T]he context in which a term is used in the asserted claim can be highly instructive." *Phillips*, 415 F.3d at 1314. To provide needed context for the jury, the whole term should be construed.

The "navigational control system" of the robot is configured to perform certain functions in a specific sequence. The law is clear that a claim should be construed as reciting an order "when the claim language, as a matter of logic or grammar, requires that the steps be performed in the order written, or the specification directly or implicitly requires' an order of steps." *Mformation Techs., Inc. v. Research in Motion Ltd.*, 764 F.3d 1392, 1398 (Fed. Cir. 2014) (quotation omitted). Here, the claim language recites a sequence and the specification confirms that sequence.

The claim language is clear, linking the claimed functions to one another: "**direct the robot about a room,**" "**return the robot . . . before completing a cleaning task in the room,**" "**dock the**

robot . . . upon return,” “recharge . . . with the robot docked” “*and then to* . . . direct the robot to continue to clean the room” (emphasis added). Consistent with Federal Circuit precedent, the claim language, both as a matter of logic and grammar, requires that the functional operations be performed autonomously and as a sequence in the order claimed.

Figure 7 illustrates a portion of the claimed sequence:



Consistent with the last claimed step (allowing the robot to “then to control the motive system to direct the robot to continue to clean the room”), “[c]ertain embodiments allow for resumption of the predetermined task or a new task upon completion of charging.” Ex. B at 3:23-25. Based on the claim language and the specification, the navigational control system is configured to perform the claimed sequence without human assistance or intervention.

IV. DISPUTED TERMS FROM THE '038 PATENT

The '038 patent describes a modular robot vacuum cleaner. Ex. C at 1:46-52. The patent explains that vacuum robots “contain many components, some of which may wear out or require service before other components.” *Id.* at 1:29-31. The patent’s solution is a “modular” robot that “allows the removal of discrete components or assemblies for repair or replacement.” *Id.* at 1:46-49; *see id.* at 5:9-42, 5:65-6:56. These removable components include a cleaning assembly carried

by the chassis, bumpers, and multiple wheel assemblies disposed on the chassis. *See id.* at 1:59-2:7, 7:61-9:40. The modular components “can be removed from a coverage robot and replaced without affecting the functionality of the robot.” *Id.* at 1:52-58.

A. “removable” (**’038 patent, claims 1, 9, and 10; ’303 patent, claims 1 and 10**)⁵

SharkNinja’s construction captures what any skilled artisan (or lay person for that matter) would understand removable to mean: capable of being detached and reattached. iRobot wants to leave the term undefined so it can argue that *any* component that can be forcefully removed—even by breaking it with a hammer—should be considered “removable.” That is contrary to the entire point of the patent—a modular robot that allows components to be easily removed for replacement or repair—and the opposite of what anyone would understand “removable” to mean. *See, e.g., Fargo Elecs., Inc. v. Iris Ltd., Inc.*, No. 04-1017 JRT/FLN, 2005 WL 3241851, at *12-13 (D. Minn. Nov. 30, 2005), *aff’d*, 287 F. App’x 96 (Fed. Cir. 2008) (“removable” means “capable of being taken away from a position without damaging the surrounding structure.”). With no limits placed on the term, *anything* can be said to be removable, as long as enough force is applied.

The ’038 patent specification and claims establish unequivocally that a “removable” component is one that “***can be removed from a coverage robot and replaced*** without affecting the functionality of the robot.” Ex. C at 1:52-58 (emphasis added); claim 1 (“[T]he drive wheel assemblies and the removable caster wheel assembly are each separately and independently removable from respective receptacles of the chassis as complete units.”); *see also id.* at 1:46-58, 2:5-7, 2:61-3:20, 5:9-11, 5:35-6:10, 7:7-11, 9:1-5, 9:41-47, Figs. 3, 5, 8-11. Indeed, the specification explicitly states that the “removable” components are capable of being “slid into”

⁵ The word “removable” appears in the claims of both the ’038 and ’303 patents. As the same analysis applies, SharkNinja briefs the term in a single section.

and “slid out” of cavities in the robot. *Id.* at 6:45-56; *see also id.* at 5:65-6:10, 7:7-11, 7:21-28. Nothing in the specification supports defining “removable” to mean separable from the robot using *any means necessary*, even if the component is broken in the process. That is simply not how a person of ordinary skill would understand the term; rather, such a person would understand “removable” to refer to something that can be removed and replaced. This is common sense.

The ’303 patent describes “removable” consistent with the ’038 patent’s description. For example, the patent explains that “removable” components are removed and replaced to facilitate installation of other parts and/or cleaning. *See Ex. D* at 5:52-54, 5:67-6:3; *see also id.* at 6:20-24, 6:61-7:47, 14:35-43, 16:31-17:3. “[R]emovable” components are those that can be “easily removed.” *Id.* at 6:31-34; *see also id.* at 6:50-52, 14:32-34. Moreover, during prosecution of the ’303 patent, iRobot overcame a rejection by distinguishing prior art where the end guard was “integral with the central member” as opposed to “removable.” *Ex. E* at 7. Thus, “removable” in the ’303 patent means the same thing as in the ’038 patent.

B. “a removable caster wheel assembly disposed on the chassis, the caster wheel being configured to turn about a vertical axis and roll about a horizontal axis” (’038 patent, claim 1)

SharkNinja’s construction clarifies for the jury that the entire caster wheel assembly (which allows the caster wheel itself to turn and roll about two axes) can be detached and reattached as a whole—precisely what the patent says about the caster wheel assembly.

The claimed “caster wheel assembly” is depicted in Figure 8.⁶ In describing that figure, the patent states that the “caster wheel assembly is separately and independently removable from the chassis...” Ex. C at 10:47-48. The caster wheel assembly also “includes a caster wheel housing 802,” and “the caster wheel 804 turns about a vertical axis and rolls about a horizontal axis ***in the*** ***caster wheel housing 802.***” *Id.* at 10:46-56 (emphasis added). This description matches exactly the claim language, which requires that the entire assembly is “separately and independently removable . . . as [a] complete unit[]” and “the caster wheel being configured to turn about a vertical axis and roll about a horizontal axis.” *Id.* at claim 1. In other words, the complete caster wheel assembly, including the housing that allows it to turn and roll about two axes, is removable. If the caster wheel assembly were removed in separate pieces (e.g., by separating the wheel from the housing), it would no longer be capable of performing the claimed function of “turn[ing] about a vertical axis and roll[ing] about a horizontal axis.” *Id.* at 10:46-56. SharkNinja’s construction clarifies that the *complete* caster wheel assembly is what allows the caster wheel to perform the claimed functions and that the *complete* caster wheel assembly can be detached and reattached without taking it apart.

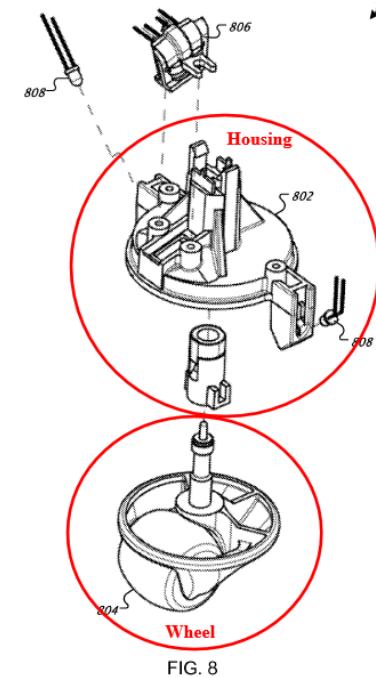


FIG. 8

iRobot’s construction has two fatal flaws. First, it completely eviscerates the word *caster* from the claim limitation. A *caster wheel assembly* is a known mechanical device with a known structure (including a post that fits into a housing and an axle about which the wheel turns).

⁶ Figures 9A-B describe a caster wheel assembly but do not show the complete assembly or describe the claimed functionality of being separately and independently removable or allowing the caster wheel to turn about two axes. See Ex. C at 11:8-18, Figs. 9A-B.

iRobot's attempt to excise that explicit language from the claim by allowing any support wheel to be called a caster wheel is inappropriate. Second, iRobot improperly attempts to read a negative limitation ("other than a drive wheel") into the claim in a clear effort to avoid certain prior art disclosed in SharkNinja's invalidity contentions. As a matter of law, adding a negative limitation to a claim via construction is only appropriate when there is some "express disclaimer or independent lexicography in the written description that would justify adding that negative limitation." *Omega Eng'g, Inc, v. Raytek Corp.*, 334 F.3d 1314, 1323 (Fed. Cir. 2003); *see GE Lighting Sols., LLC v. AgiLight, Inc.*, 750 F.3d 1304, 1309 (Fed. Cir. 2014). Neither situation is present here. Nonetheless, iRobot seeks to construe what the "caster wheel assembly" cannot be, instead of what it is. This is not only improper, it is incorrect. There is no basis for preventing the caster wheel assembly from including a drive wheel, as long as the assembly and wheel meet the remainder of the claim. Ex. C at 2:5-7, 10:46-11:7.

V. DISPUTED TERMS FROM THE '048 PATENT

The '048 patent describes a system including a mobile robot vacuum and a "robotic cleaner maintenance station that services the robot and evacuates all collected debris." Ex. F at Abstract, Title, 1:41-4:3. When docked at the maintenance station, the robot evacuates the collected debris through a service opening in its dust bin, which may be located in one of three locations: the top, bottom or rear of the dustbin. *See, e.g., id.* at Figs. 9-17C, 8:8-14, 8:22-24, 8:57-65, 9:43-10:2. The maintenance station also has a dust bin that collects debris from the robot and can be removed. *Id.* at 6:18-28, Figs. 4, 5.

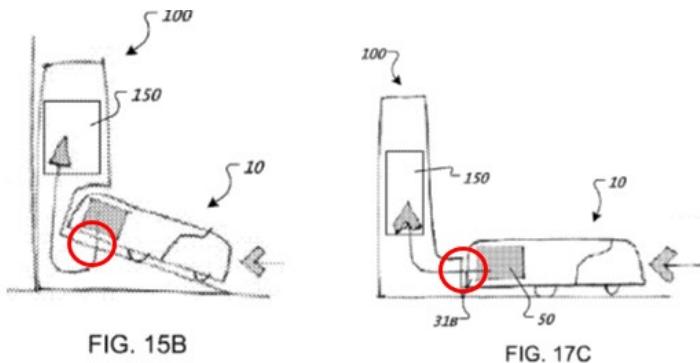
A. "service opening in a bottom portion of the cleaning bin" ('048 patent, claim 12)⁷

The intrinsic record makes clear that the "bottom portion" refers to the "bottom surface"

⁷ This term was briefed and argued as part of iRobot's PI motion. *See* Dkt. 77 at 7-11.

of the cleaning bin of a robot, as distinct from the rear or top surfaces of the bin—the other two possible locations discussed in the patent. The entire record supports SharkNinja’s construction, but most importantly, iRobot explicitly equated “bottom portion” with “bottom surface” when it relied on this very limitation to distinguish prior art.

As explained in SharkNinja’s opposition to iRobot’s PI Motion, the ’048 patent consistently distinguishes the three alternative placements of the service opening (*i.e.*, the “evacuation port”): the bottom, the top and the rear. *See Dkt. 50 at 5-6 (citing Ex. F at 8:8-14, 8:22-24, 9:43-10:4, 16:6-35, Figs. 14C, 15B, 16B, 17); see also Dkt. 78 at 9.* There is absolutely no suggestion that the term “bottom portion” could refer to anything other than the bottom surface. The best example in the specification is the distinction between Figures 15B and 17C:



The specification states that in Figure 15B, debris is evacuated “out of the **bottom** of the robot bin 50.” Ex. F at 9:57-60. In Figure 17C, debris is instead evacuated “out of the **rear** of the robot bin 50.” *Id.* at 10:1-2. This disclosure could not be clearer that when the claim recites a “bottom” portion of the bin it is referring to an embodiment such as Figure 15B, as distinct from Figure 17C.

The prosecution history also compels SharkNinja’s construction. The pending claims in the parent application required a robot with a “a service opening in a **top portion** of the cleaning

SharkNinja incorporates that briefing and argument here. *See* Dkts. 50 and 75.

bin.” Ex. G at 3, 6, 7 (emphasis added). iRobot amended “top portion” to “bottom portion” to avoid prior art. Ex. H at 4. In distinguishing the amended claims over the prior art, iRobot identified the very limitation under consideration as the point of distinction, arguing: “Reed’s system requires the debris outlet to be on a ***top surface*** of the mobile unit, and ***not a bottom surface***, in order to mate with the lowered arm of the housing.” *Id.* at 11 (emphasis added). iRobot unequivocally equated “bottom portion” with “bottom surface,” consistent with the plain language of the claim and the specification. Here, that prior art distinction, with respect to the ***identical*** limitation that ultimately issued in claim 12 of the ’048 patent, precludes any argument that “bottom portion” means something broader than “bottom surface.”

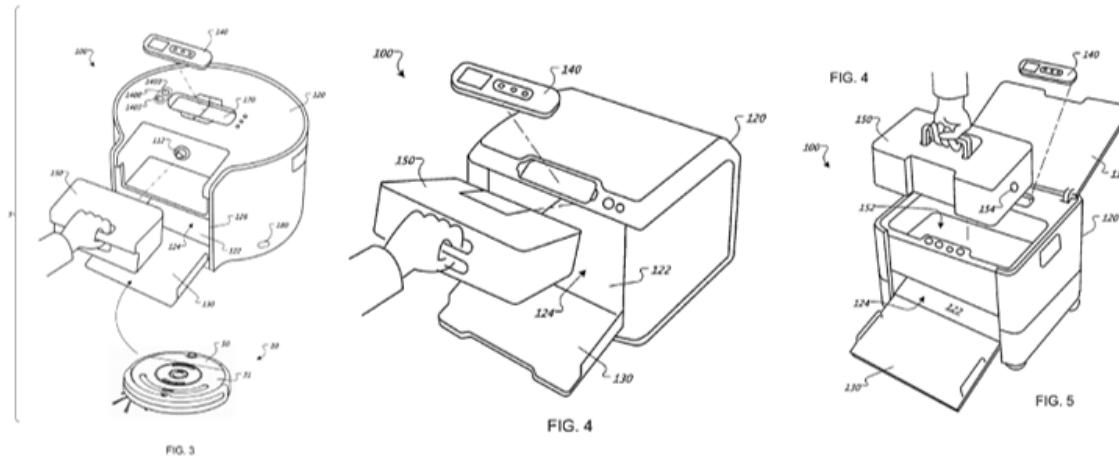
iRobot made similar distinctions between the bottom, top and rear of the robot throughout prosecution of the parent and in the grandparent application. *See, e.g.*, Ex. H at 12; Ex. J at 11-12; Ex. I at 3, 11. Of particular note, iRobot distinguished between a port on the back of the cleaning bin versus the top or bottom, stating that this is “***not a trivial distinction***.” Ex. I at 11-12 (emphasis added). Indeed, as the Court noted in its PI Order, iRobot “purposefully sought to distinguish those areas.” Dkt. 78 (PI Order) at 9.

In short, iRobot consistently made clear throughout the intrinsic record that the “bottom portion” refers to the “bottom surface” of the bin as distinct from the top or rear of the bin. *Omega Eng’g*, 334 F.3d at 1333 (“As long as the same claim limitation is at issue, prosecution disclaimer made on the same limitation in an ancestor application will attach.”). iRobot should not be permitted to obtain its claims by arguing that “bottom portion” means “bottom surface” yet now in litigation argue the opposite. Aligning with “the prosecution history ensures that claims are not construed one way in order to obtain their allowance and in a different way against accused infringers.” *Chimie v. PPG Industries Inc.*, 402 F.3d 1371, 1384 (Fed. Cir. 2005).

B. “disengaged from the station housing in a vertical direction relative to the station housing” (‘048 patent, claim 12)

SharkNinja construes this term to clarify for the jury that it is the ***disengagement*** of the collection bin from the housing that must be done in a vertical direction. iRobot's alternative construction seeks to eliminate the concept of "disengagement" from the claim altogether and replace it with the concept of separation or removal. But the claim is agnostic as to what direction the collection bin is "removed" or "separated" from the housing ***after*** it is disengaged; the claim is concerned only with the direction of the disengagement from the housing.

The '048 patent makes clear that “disengagement . . . in vertical direction” means that there is a mechanical structure that facilitates release of the bin from an engaged position by moving the bin vertically. The patent provides three examples (shown in Figures 3-5, below) of how the collection bin can be disengaged from the housing: (1) “disengaged substantially parallel to the ground (Fig. 3),” (2) “disengaged substantially parallel to the ground” (Fig. 4), and (3) “disengaged in a vertical direction (Fig. 5).” Ex. F at 6:18-27.



As Figure 5 shows, the vertical disengagement option is accomplished with corresponding grooves in the cleaning bin and maintenance station that permits only vertical movement to disengage. After the bin is released, however, it can move in any direction—not just vertically.

Other portions of the specification confirm that the inventors intended “engagement” or

“disengagement” to refer to the mating and un-mating of two devices, and not simply to the general direction in which they are removed or separated from one another.⁸ For example, the specification describes a clip that is designed to “engage” and “lock the robot 10 in place during servicing of the bin.” *Id.* at 7:28-33. Similarly, the specification describes an evacuation port assembly to “engage[] the station evacuation assembly” and then to “disengage[] the port cover” on the cleaning bin, depicted in Figs. 10A and B. *Id.* at 8:30-39, Figs. 10A, 10B.

C. “a bagless cyclonic vacuum configured to divert debris from an incoming flow using centripetal acceleration of the debris” ('048 patent, claim 12)

“Cyclonic vacuum” is an industry term of art with a specific meaning; it is not a common phrase that a lay juror would understand. Not every vacuum is a cyclonic vacuum. Instead, a cyclonic vacuum is a specific type of vacuum having a structure designed to create a specific type of airflow to separate debris from the air. This is consistent with the sole mention of a cyclonic vacuum in the specification, as well as numerous other contemporaneous publications. *See Ex. F* at 13:62-65 (noting that a cyclonic vacuum system is one that “diverts debris using centripetal acceleration of debris . . . to divert the debris from the vacuum filter or flow”).⁹ SharkNinja’s construction makes clear that a cyclonic vacuum refers to one that is designed and structured to create cyclonic airflow to separate the debris from the air.

There are two differences between SharkNinja’s and iRobot’s constructions, both of which

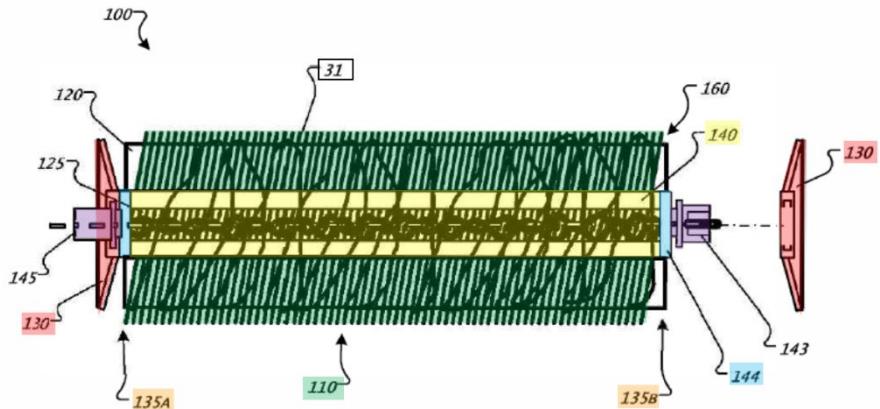
⁸ This is supported by the definition of “disengage,” meaning “to release from something that engages” (*Ex. K*) or “to release from something that engages or involves” (*Ex. L*).

⁹ See also, *e.g.*, *Ex. M* at 9, 11 (describing cyclonic technology as designed with “cylinder-on-cone cyclone with a tangential entry” as the “industry standard design,” and/or with different types of “inlet configurations” for centrifugal separators); *Ex. N* (defining the mechanical engineering use of “cyclone” as “[a]ny cone-shaped air-cleaning apparatus operated by centrifugal separation that is used in particle collecting. . . ”); *Ex. O ¶¶ [0002], [0005]-[0006], [0045], [0053]-[0071], Figs. 3, 6* (disclosing a “widely used” vacuum cleaner using cyclonic technology “to generate cyclone airflows and filter the foreign object[s] contained in the air.”).

reflect mischief that iRobot apparently intends to make with this term. *First*, iRobot's construction eliminates "configured to" from the claim. This subtle but important difference would allow iRobot to argue that a vacuum that has no structure designed to create cyclonic airflow could somehow infringe if some cyclonic airflow is inadvertently created. *Second*, iRobot's construction adds "at least some" to describe the "debris" that is separated. iRobot's motivations are clear: it seeks to broaden the scope of the claim term such that if it can find a device with a single piece of debris that is separated due to some inadvertent cyclonic airflow, it can argue that device is a "cyclonic vacuum." That is simply not what one of ordinary skill in the art understand a "cyclonic vacuum" to mean, and not what the claim covers.

VI. DISPUTED TERMS FROM THE '303 PATENT

The '303 patent describes a floor cleaner that includes a chassis carrying a cleaning assembly and a driven brush rotatably coupled to the assembly housing with a removable axial end guard. Ex. D at 1:35-52. Figure 3 (annotated below) depicts a driven brush having a core 140, bristles 110, brush ends 135A-B, end caps 144, bearings/ bushings 143, and a removable end guard 130. *Id.* at 5:6-6:3, 6:38-52, Figs. 2, 4-6, 25A-C. As the cleaner sweeps, "filaments or hairs 31 may wind off the end" of the brush, pass the end caps, and "enter bushings or bearings . . . causing decreased cleaning performance or jamming." *Id.* at 5:9-15, *see id.* at Fig. 2 (showing filaments 31 wound on the core). The patent accordingly discloses removable "end guards . . . configured to prevent spooled filaments from traversing axially from the outer core surface onto the mounting features." *Id.* at 1:48-52; *see also* 5:16-6:67, 14:47-15:6.



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SharkNinja's constructions for the '303 patent simplify technical terms for the jury, which is the purpose of claim construction. *See e.g., Abbott Labs. v. Sandoz, Inc.*, 544 F.3d 1341, 1360 (Fed. Cir. 2008); *see also Voice Domain Techs., LLC v. Apple Inc.*, No. CV 13-40138-TSH, 2015 WL 4638577, at *13-14 (D. Mass. Aug. 4, 2015).

A. “prevent spooled filaments from traversing axially beyond the extremity of [the end mounting feature about which the axial end guard is mounted / at least one of the end mounting features]” ('303 patent, claims 1 and 10)

The language of this claim term is complex and may be difficult for a jury to understand. SharkNinja's construction, which is taken directly from the specification, seeks to simplify this complicated phrase. iRobot, on the other hand, takes the opposite approach—its proposal would require the jury to sort through a thicket of technical terms to understand what is a simple concept.

The '303 patent states that the purpose of the removable end guards 130 is to “limit the longitudinal travel of filaments 33, keep filaments 33 and collected hair 33 **within the brush ends** 135A-B, and/or **prevent hair 33 from spilling over onto bearings 143.**” Ex. D at 5:16-22 (emphasis added); *see also id.* at 5:9-15, 5:67-6:24, 14:47-15:4, Figs. 2-6, 25A-C. This is what SharkNinja's construction requires: keep filaments within the brush ends. The patent also explains that when the end guard is in place it is “adjacent the ends of the outer core surface.” *Id.* at 1:48-52; *see also id.* at Figs. 3-6, 25A, 25C. In this position, the **removable end guard 130** is a barrier between the **brush ends 135A-B** and the **bearings 143.** *See* Fig. 3 annotated above.

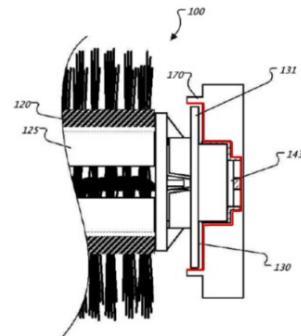
Moreover, the claims and specification explain that the end guard should prevent filaments from travelling “beyond the extremity of the end mounting feature” (*id.* at claim 1) and “onto the mounting features” (*id.* at 1:48-52). While the '303 patent does not use the term “end mounting feature” to describe any element depicted in the figures, a person of ordinary skill would understand that at least the bearings 143 are an example of an “end mounting feature.” For instance, the patent explains that filaments and hair should not be allowed to “spill[] over onto bearings 143

that may be located at either one or both longitudinal ends of the roller 100.”¹⁰ *Id.* at 5:16-22; *see id.* at 6:12-19, 6:56-59, 7:8-19, 7:36-47, 9:15-19, 14:50-57. Thus, a simple and accurate way to describe the claimed function of the end guard is that filaments must be kept within the brush ends 135A-B. *See id.*; Fig. 3 annotated above (showing filaments 31 trapped within the brush ends 135A-B). This construction is understandable, does not require the jury to guess at what “end mounting features” are, and accurately captures what is meant by the claim language.

B. “labyrinth seal” ('303 patent, claim 9)

“Labyrinth seal” is not a common term understandable to a lay juror, but it is a term of art readily understood by skilled artisans. SharkNinja’s construction explains what a “labyrinth seal” is in plain English and is consistent with the specification.¹¹

The '303 patent depicts a labyrinth seal in Figure 6 and explains that a “labyrinth wall 170 forms a simple labyrinth seal that further prevents accumulations of hair and other filaments 33 from passing the end guard 130 to enter the area where the bearing/bushing 143 is mounted.” Ex. D at 6:53-59. This is shown in Figure 6 as having a maze-like pattern (shown in red).



SharkNinja’s construction is also supported by dictionaries, which establish that a “labyrinth seal” forms a “contorted” or “maze-like” path. *See, e.g.*, Ex. P at 238 (“a labyrinth seal functions by providing **a contorted path** to inhibit the leakage.”) (emphasis added); *id.* at 138, 238-49; Ex. Q (“The basic principle of a Labyrinth Seal is based on the **geometric shape of the maze-like labyrinth.**”) (emphasis added); Ex. R (“All contaminants trying to enter the bearing housing

¹⁰ iRobot’s construction fails to provide clarity on what the claimed “end mounting features” are.

¹¹ iRobot apparently does not disagree with SharkNinja’s construction, as it stated during the parties’ meet and confer that it would agree to SharkNinja’s construction if SharkNinja agreed “that the construction does not have a bearing on [] infringement or validity . . .”

must go through the seal’s maze (labyrinth) of turns and angles in order to reach the bearing.”). Since a lay-juror may not understand “labyrinth seal,” it should be construed in a simple way consistent with the understanding of a person of ordinary skill.

VII. DISPUTED TERMS FROM THE '676 PATENT

The '676 patent claims a method of cleaning a room comprising a number of steps, including “transmitting . . . from” the robot to a mobile device and “receiving from” the mobile device at the robot certain information. The patent explains that a communication link between the robot and mobile device is used to exchange information on: (1) configuring the robot; (2) scheduling the robot; (3) status of robot operations; and (4) controlling the robot. Ex. S at 5:62-8-46; 10:46-52. The asserted claims address the exchange of status and control information (items (3) and (4)). In claim 1, status information transmitted from the robot to the mobile device is “a power level report” and “a mission status report.” The robot also transmits an “error report.” In claim 10, the robot receives control information as “a command to perform a cleaning operation” from the mobile device. Regardless of the type of information exchanged between the robot and the mobile device, communication between them is consistently described as through a “link,” by which the robot and mobile device are linked together to exchange information. *See id.* at 2:50-4:3; 5:62-8:46; 10:35-11:32 and Figs. 6A-6C, 7; and 11:33-12:12.

A. “transmitting...” and “receiving...” terms ('676 patent, claims 1 and 10)

With respect to the “transmitting” and “receiving” terms, iRobot contends no construction is necessary. The claims, however, require that the robot and a mobile device must exchange specific information for the method to be performed. The specification consistently explains that when information is exchanged between the robot and a mobile device a communication link between the two is established. *See Ex. S at 2:50-4:3; 5:62-8:46; 10:35-11:32 and Figs. 6A-6C; and 11:33-12:12 and Fig. 7.* The patent explains that this ability to transmit and receive information

between a robot and mobile device distinguished prior art, which required a user or a separate device, such as a PC. *See id.* at 1:34-2:34.

As to transmitting, the specification explains that information can be transmitted from the robot to the mobile device, which can include, *inter alia*, an error report, a power level report, and a mission status report. *Id.* at 3:64-4:15; *see also* 8:38-46. As to receiving, the specification explains that a user can input information to a hand-held remote device that is sent to and received by the robot. *Id.* at 4:16-29; *see also* 9:44-55. This allows the user to “directly control a function of the robotic device through a wireless connection.” *Id.* at 4:23-24; *see also* 2:45-47. Those communications occur through a link between the robot and the device. *See id.* The ’676 patent explains that in addition to establishing a communication link, that link can be optionally authenticated. *See id.* at 11:46-50, 12:3-12, and claim 12. The additional authentication of a link in dependent claim 12 confirms that a communication link has been established for the method of claim 1 to be performed.

The ’676 patent provides examples of the communication link used for transmitting and receiving. In particular, Figures 6A-6C “show various means of linking” a communication device with a robot, including, respectively, a wireless connection, a cable connection, and a direct connection. *Id.* at 10:35-11:32. With this “linking,” control information can be sent from the mobile device to the robot and information such as status reports and error reports can be communicated back to the mobile device from the robot. *Id.* at 10:49-52.

By contending that no construction is necessary, iRobot would have the Court ignore that transmitting “from the robotic cleaning device to the mobile device” and receiving “from the mobile device at the robotic cleaning device” mean that a communication link must be established between the two to perform these operations. These specifically recited functions are captured by

SharkNinja's constructions and ignored by iRobot's proposal of no construction.

B. “mission status report” ('676 patent, claims 1, 4, 5, 11, and 12)

In the context of the claims and specification, “a mission status report” is a description of the status of a cleaning task. By using the word “report,” the claims signal that “mission status report” is more than simply robot status information and should be construed as a report—that is a description—of a cleaning task.

The patent uses “mission” to refer to a specific cleaning mission assigned by a user: “stored cleaning mission” (Ex. S at 1:53), “the missions or tasks that the robotic device carries out can be tailored to a user’s requirements” (*id.* at 7:57-58), “preprogrammed mission or task” (*id.* at 8:5-6, 20), “specified cleaning mission” (*id.* at 8:25-26), “mission status reports (e.g., mission completed/abandoned/battery depleted, etc.)” (*id.* at 8:45-45), “specific mission” (*id.* at 9:3), and “scheduled mission” (*id.* at 12:16). In each instance, a mission refers to a specific cleaning task.

Further, “mission status report” should be construed as different from the separately recited “power level report” and “error report.” *See id.* at claim 1. The patent describes such other types of “status reports,” namely, “an error report, a power level report” (*id.* at 3:64-4:3), “power level or dirt compartment level status reports, error reports” (*id.* at 8:40-46), refers to “status reports” generally (*id.* at 10:49-54), and separately describes “the status of the robotic device” (*id.* at 6:38-39). By differentiating between types of “status reports,” the term “mission status report” should not be construed so broadly to cover other types of reports or robot status information not associated with a specific cleaning mission. Instead, “mission status report” should be construed as a description of the status of a cleaning task.

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/s/ Alissa K. Lipton

Alissa K. Lipton BBO#678314
FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, LLP
Two Seaport Lane
Boston, MA 02210-2001
(617) 646-1643
alissa.lipton@finnegan.com

Doris Johnson Hines
FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, LLP
901 New York Avenue, N.W.
Washington, D.C. 20001-4413
(202) 408-4000

Erika Harmon Arner
FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, LLP
Two Freedom Square
11955 Freedom Drive
Reston, VA 20190
(571) 203-2700

Brian A. Rosenthal
GIBSON, DUNN & CRUTCHER LLP
200 Park Avenue
New York, NY 10166
(212) 351-4000

*Attorneys for Defendants
SharkNinja Operating LLC,
SharkNinja Management LLC, and
SharkNinja Sales Company*

CERTIFICATE OF SERVICE

I hereby certify that the foregoing document was filed through the ECF system on May 21, 2020 and will be sent electronically to the registered participants identified on the Notice of Electronic Filing.

/s/ Alissa K. Lipton

Alissa K. Lipton